

Tunable Semiconductor Diodes

Abstract

A diode structure that facilitates tuning the breakdown voltage of the diode structure, and a method for forming and operating the diode structure. In a P⁻ substrate, a N⁺ layer is implanted. The N⁺ layer has an opening whose size affects the breakdown voltage of the diode structure. Upon the N⁺ layer, an N⁻ layer is implanted in the substrate. Then, a P⁺ region is formed to serve as an anode of the diode structure. An N⁺ region can be formed on the surface of the substrate to serve as a cathode of the diode structure. By changing the size of the opening in the N⁺ layer during fabrication, the breakdown voltage of the diode structure can be changed (tuned) to a desired value.